

Cooperation Agreement

between

**Helmholtz Centre Potsdam GFZ
German Research Centre for Geosciences
("GFZ")
Telegrafenberg 14473 Potsdam, Germany**

and

**Hanoi University of Mining and Geology
("HUMG")
Hanoi, Vietnam**

both here referred to as "parties"

§ 1 Background

Both parties share the interest to start a cooperation about running a GNSS system observing the scintillations of the ionosphere in Hanoi, Vietnam. As is known, Hanoi is exactly located under the northern peak of equatorial ionospheric anomaly, and therefore all GNSS applications are massively affected by scintillation activities. The ionosphere in general and ionospheric scintillation in particular are decisive factors affecting the quality of satellite signals. Capturing the appearance features and their variation rules will help improve the quality of all GNSS applications. Basically, HUMG meets all technical requirements such as open view space, infrastructure, quality of internet connection, etc, to set up a high-rate GNSS station. This new observation station will be added and linked to the list of GFZ's global monitoring stations that have been deployed around the world.

§ 2 Aims of the Agreement

The objective of the project is to establish a high frequency (50Hz) GNSS receiver station, which is capable of detecting plasma irregularities in the ionosphere. This multi-satellite receiver system is also capable of providing data to calculate TEC (Total Electron Content), an important descriptive quantity for the ionosphere of the Earth. This Agreement is the basis for the two sides to work towards deeper scientific cooperation in the future, especially the exploitation of the GNSS observing system in the study of the ionosphere and space weather in the northern region of Vietnam. The system after being deployed will bring positive scientific effects to both HUMG and GFZ.

Both parties agree that they shall perform their obligations on a best effort basis

§ 3 Responsibilities of GFZ

- 3.1 GFZ supplies equipment for the station installation, i.e., a leading edge GNSS receiver with additional devices (splitter, cable, computer, power supply) for the permanent operation in Hanoi.
- 3.2 GFZ is responsible for obtaining the necessary export licences and the transport of the equipment to Hanoi.
- 3.3 GFZ will provide remote control and maintenance to ensure longterm system operation.
- 3.4 GFZ ensures that the collected data is used for scientific purpose, without compromising security.

§ 4 Responsibilities of HUMG

- 4.1 HUMG provides suitable (fenced and secured) spaces for housing the GNSS equipment.
- 4.2 HUMG will provide a reliable power supply and lightning protection, and will ensure proper network connection.
- 4.3 HUMG will support GFZ in the maintenance of the systems in best effort manner.
- 4.4 HUMG supports GFZ in the import to Vietnam and re-exportation to GFZ and in obtaining visa for the German experts, if necessary.

§ 5 Financial Arrangements

- 5.1 This is an unfunded Agreement. Any financial arrangements shall be negotiated separately and will depend on the availability of funds.
- 5.2 All financial expenses arising in conjunction with the setup of the GNSS station at HUMG, like station hardware and spare parts, import taxes, broker costs, shipment costs will be covered by GFZ. Costs for operation at HUMG, as, e.g., technical support, provision of electrical power and internet connection are covered by HUMG.

§ 6 Limitation of contractual liability

- 6.1 Liability shall be limited to wilful misconduct or gross negligence.
- 6.2 No Party shall be responsible to the other Party for any indirect or consequential loss or similar damage such as, but not limited to, loss of profit, loss of revenue or loss of contracts.

§ 7 Contacts and Notices

Any notice required to be given under this Agreement shall be given in writing and delivered via email of scanned document (a PDF is sufficient) with documentation of delivery. A notice shall be deemed effective when received.

Notices shall be delivered to:

For HUMG:

Assoc. Prof. Dr. Le Duc Tinh
The Dean of Faculty of Geomatics and Land Administration
leductinh@humg.edu.vn
Tel: +84 912296180

Alternate contact:

Dr. Duong Thanh Trung
The Vice Dean of Faculty of Geomatics and Land Administration
duongthanhtrung@humg.edu.vn
Tel: +84 932202162

For GFZ:

Prof. Dr. Jens Wickert
Research Topic Director "The Atmosphere in Global Change"
wickert@gfz-potsdam.de
Tel: +49 331 288-1758

Dr. Benjamin Männel
Working Group Leader GNSS
benjamin.maennel@gfz-potsdam.de
Tel: +49 331 288-2815

Technical contact:

Dr. Markus Ramatschi
markus.ramatschi@gfz-potsdam.de
Tel: +49 331 288-1748

§ 8 Duration of the Agreement and Amendments

This scientific-technical agreement on terrestrial measurements and their exploitation shall enter into force upon signature of both partners.

The agreement is valid for a period of five years and will automatically be prolonged for one year at a time if not terminated by one partner three months before its expiry.

§ 9 Signatures

On behalf of
The Research Centre for Geosciences
GFZ, Helmholtz Centre Potsdam,
Germany

04. April 2023


.....
GFZ Scientific Executive Director
Prof. Dr. Susanne Buitert


.....
GFZ Administrative Executive Director
Dr. Stefan Schwartze

On behalf of
Hanoi University of Mining and Geology
(HUMG), Hanoi, Vietnam



.....
Rector
Prof. Dr. Tran Thanh Hai


.....
Dean of Faculty of Geomatics and Land
Administration
Assoc. Prof. Dr. Le Duc Tinh



HELMHOLTZ CENTRE POTSDAM
**GFZ GERMAN RESEARCH CENTRE
FOR GEOSCIENCES**

GFZ · P.O. Box 60 07 51 · 14407 Potsdam

Dr. Duong Thanh Trung
The Vice Dean of Faculty of Geomatics
and Land Administration

Hanoi University of Mining and Geology

No.18 Pho Vien Street, Duc Thang
ward, Bac Tu Liem district, Hanoi,
Vietnam
Mobile: +84 32202162

Dr. M. Ramatschi
Section 1.1
GPS/Galileo Earth Observation
Telegrafenberg
14473 Potsdam
maram@gfz-potsdam.de
Telephone: +49 (0)331 288-1746
Telefax: +49 (0)331 288-1759

Potsdam, May 17, 2023

Pro-Forma Invoice

Item	Qty	Total Value	HS Code
GNSS data logger system <ul style="list-style-type: none"> • tinyPC • Javad receiver • Splitter • Power Supply • Router 	1	980 €	9015.8040
SUM		980 €	

Scientific equipment!
No commercial value, not for resale!

Helmholtz Centre Potsdam · GFZ German Research Centre for Geosciences · Public Law Foundation
Telegrafenberg · 14473 Potsdam · www.gfz-potsdam.de
Board of Trustees: MinDirig'in Oda Keppler (Chair)
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HELMHOLTZ

WAYBILL DOC

Not to be attached to package - Hand to Courier
2023-05-23 MYDHL+ /



Shipper :

Helmholtz-Zentrum Potsdam
Markus Ramatschi
Telegrafenberg
14473 POTSDAM
Germany

Contact:
+4903312881601

Receiver :

Hanoi University of Mining and Geology
Dr. Duong Thanh Trung
Pho Vien street 18
The Vice Dean of the Faculty of Geomatics and
Land Administration

Contact:
Dr. Duong Thanh Trung
+84322021620

**HANOI BAC TU LIEM IZ
Vietnam**

1160DE-BER-BER VN-HAN-HNC

Product Details:

[P] EXPRESS WORLDWIDE (48)

Payer Details

Freight A/C: 140257548
Duty A/C: Receiver Will Pay
Taxes A/C: Receiver Will Pay

Features / Services (Service Code)

Automated Digital Imaging(PJ)
Emergency Situation(CR)
Duties & Taxes Unpaid(DS)

Shipment Details

Ref: Markus Ramatschi
Custom Val: 980,00 EUR

Cust Decl Shpt Wgt (UOM) / Dim Wgt (UOM):

17,0 kg

Pieces

1

Name (In Capital Letters)

Signature

Date (DD.MM.YYYY)



Contents: GNSS data
logger system,
tinyPC, JAVAD r
ceiver, Splitter,
Router

WAYBILL 25 8412 2225

License Plates of pieces in shipment

JD014600010919614368

